

In re Application of: Ariel PELED et al.
Serial No.: 10/815,764
Filed: April 2, 2004
Final Office Action Mailing Date: December 23, 2008

Examiner: Navneet K. AHLUWALIA
Group Art Unit: 2166
Attorney Docket: 27655

In the claims:

1. (Currently Amended) A method for detecting an information item within an information sequence obtained from a digital medium, said information item comprising any one of a specified set of prestored information items whose distribution it is desired to control, comprising:

transforming each of said set of prestored information items whose distribution it is desired to control from a first representation format into a respective format facilitating fast a first comparison, said first comparison being fast in relation to a second relatively slower textual comparison, in accordance with a predetermined transformation format, said predetermined transformation format being preservative of meaning;

transforming said information sequence obtained from said digital medium, into said format facilitating said first relatively fast comparison in accordance with said transformation format;

determining the presence of one or more of said prestored information items within said transformed information sequence, said determining comprising:

comparing said information sequence with said information item in said format facilitating said relatively fast comparison; and

if when a match is found between said formats facilitating said relatively fast comparison then carrying out a said second relatively slower textual comparison between said respective prestored information item and said extracted information sequence, and

when a match is found using said second relatively slower textual comparison, applying a policy to control distribution of said information sequence.

2. (Original) A method according to claim 1, further comprising storing said representations in a database.

3. (Original) A method according to claim 1, further comprising sorting said representations into a sorted list.

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4. (Original) A method according to claim 3, wherein said sorting is in accordance with a tree sorting algorithm.

5. (Original) A method according to claim 1, wherein said information item comprises a single word.

6. (Original) A method according to claim 1, wherein said information item comprises a sequence of words.

7. (Original) A method according to claim 1, wherein said information item comprises a delimited sequence of sub-items.

8. (Original) A method according to claim 7, wherein each of said sub-items comprises a sequence of alphanumeric characters.

9. (Original) A method according to claim 1, wherein a type of said information item comprises one of a group of types comprising: a word, a phrase, a number, a credit-card number, a social security number, a name, an address, an email address, and an account number.

10. (Original) A method according to claim 1, wherein said information sequence is provided over a digital traffic channel.

11. (Original) A method according to claim 10, wherein said digital traffic channel comprises one of a group of channels comprising: email, instant messaging, peer-to-peer network, fax, and a local area network.

12. (Original) A method according to claim 1, wherein said information sequence comprises the body of an email.

13. (Original) A method according to claim 1, wherein said information sequence comprises an email attachment.

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14. (Original) A method according to claim 1, further comprising retrieving said information sequence from a digital storage medium.

15. (Previously Presented) A method according to claim 14, wherein said digital storage medium comprises a digital cache memory.

16. (Original) A method according to claim 1, wherein said representation depends only on the textual and numeric content of the information item.

17. (Previously Presented) A method according to claim 1, wherein said transforming into a format that facilitates fast comparison comprises Unicode encoding.

18. (Previously Presented) A method according to claim 1, wherein said transforming into a format that facilitates fast comparison comprises converting all characters to upper-case characters or to lower-case characters.

19. (Previously Presented) A method according to claim 1, wherein said transforming into a format that facilitates fast comparison comprises encoding an information item into a numeric representation.

20. (Previously Presented) A method according to claim 1, wherein said transforming into a format that facilitates fast comparison comprises applying a first hashing function to said representations.

21. (Original) A method according to claim 1, wherein said information sequence comprises sub-sequences.

22. (Original) A method according to claim 21, wherein said sub-sequences are separated by delimiters.

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23. (Original) A method according to claim 22 wherein said sub-sequences separated by delimiters are any of: words; names, and numbers.

24. (Original) A method according to claim 23, further comprising scanning said information sequence to identify said sub-sequences.

25. (Original) A method according to claim 24, and said determining is performed by matching said information item to an ordered series of said sub-sequences.

26. (Cancelled)

27. (Currently Amended) A method according to claim 26_1, wherein said policy is a security policy, said security policy comprises at least one of the following group of security policies: blocking said transmission, logging a record of said detection and detection details, and reporting said detection and detection details.

28. (Currently Amended) A method according to claim 2627, wherein said information items are divided into sets, and wherein said security policy depends on the number of detected information items that belong to the same set.

29. (Original) A method according to claim 28 wherein each of said sets comprises information items associated with a single individual.

30. (Original) A method according to claim 1, wherein said information item comprises a sequence of sub-items.

31. (Original) A method according to claim 30, wherein said sub-items are separated by delimiters.

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32. (Original) A method according to claim 30, wherein a sub-item comprises one of a group comprising: a word, a number, and a character string.

33. (Original) A method according to claim 30, wherein said determining comprises using a state machine operable to detect said sequence of delimited sub-items within said information sequence.

34. (Previously Presented) A method according to claim 30, wherein said transforming into a format facilitating fast comparison comprises:

applying a first hashing function to assign a respective preliminary hash value to each sub-item within said information item; and

applying a second hashing function to assigning a global hash value to said information item based on said preliminary hash values of said sub-items.

35. (Original) A method according to claim 34, wherein said information sequence comprises sub-sequences, and wherein said determining comprises:

applying said first hashing function to assign a respective preliminary hash value to each of said sub-sequences;

applying said second hashing function to at least one of said preliminary hash values to assign a global hash value to said at least one of said sub-sequences; and

comparing said global hash value to hash values of said sub-sequences.

36. (Original) A method according to claim 35, wherein said sub-sequences comprise one of a group comprising: a word, a number, and a character string

37. (Previously Presented) A method according to claim 35, wherein said sub-sequences comprise a plurality of ordered combinations of sub-sequences within said data sequence.

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38. (Previously Presented) A method according to claim 36, wherein said sub-sequences comprise a plurality of combinations of sub-sequences within said data sequence.

39. (Original) A method according to claim 38, wherein said second hash function is invariant to reordering of at least two of said sub-sequences.

40. (Previously Presented) A method according to claim 39, further comprising checking whether a delimited segment was previously stored, and continuing said detection process only if a current delimited segment was previously stored.

41-48 (Cancelled)

49. (Currently Amended) An apparatus for detecting a predefined information item within a new information sequence for distribution control, said information item being any one of a specified set of data items, comprising:

a preprocessor, for transforming said predefined information item into a canonical representation said transformation being preservative of meaning, in accordance with a canonical transformation format; and

a scanner, for scanning said new information sequence to identify sub-sequences therewithin; and

a comparator associated with said preprocessor and said scanner, for making a first relatively fast comparison involving comparing said canonical representation to said identified sub-sequences to make an initial determination of the presence of said specified information item within said information sequence, and wherever a match is found using said relatively fast comparison involving canonical representation, then for comparing original text wherever said initial to make a second determination indicates of a match, the apparatus being configured to apply a policy for controlling distribution of said information sequence when said match is detected.

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50. (Original) An apparatus for detecting a specified information item within an information sequence according to claim 49, further comprising a user interface for inputting said information items.

51. (Previously Presented) An apparatus for detecting a specified information item within an information sequence according to claim 49, wherein said scanner is further operable to transform said information sequence in accordance with said canonical transformation format.

52. (Previously Presented) An apparatus for detecting a specified information item within an information sequence according to claim 49, wherein said scanner is further operable to transform said sub-sequences in accordance with said canonical transformation format.

53. (Original) An apparatus for detecting a specified information item within an information sequence according to claim 49, further comprising a database for storing a representation of each data item of said set.

54. (Original) An apparatus for detecting a specified information item within an information sequence according to claim 49, wherein said information sequence is obtained from a digital medium.

55. (Original) An apparatus for detecting a specified information item within an information sequence according to claim 49, further comprising a sorter, for forming a sorted list of the respective representations of set of data items.

56. (Original) An apparatus for detecting a specified information item within an information sequence according to claim 49, wherein a type of said information item comprises one of a group of types comprising: a word, a phrase, a number, a credit-card number, a social security number, a name, an address, an email address, and an account number.

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57. (Original) An apparatus for detecting a specified information item within an information sequence according to claim 49, wherein said information sequence is provided over a digital traffic channel.

58. (Original) An apparatus for detecting a specified information item within an information sequence according to claim 49, further comprising retrieving said information sequence from a digital storage medium.

59. (Original) An apparatus for detecting a specified information item within an information sequence according to claim 58, wherein said digital storage medium comprises digital storage medium within a proxy server.

60. (Cancelled)

61. (Original) An apparatus for detecting a specified information item within an information sequence according to claim 49, wherein said encoding function comprises a hashing function.

62. (Original) A method according to claim 2, wherein said transforming said representation and storage of said information items comprises:

a) assigning a hash value to each delimited segment within said information item;

b) assigning a hash value for said information item based on said hashes assigned to delimited segments within said information item;

c) storing said hash values evaluated in step a) and step b) above; and wherein detecting said information items within said digital medium comprises:

d) assigning a hash value to each delimited segment within said digital medium utilizing the same hash function used in step a) above;

e) assigning a hash value for sequences of delimited segments utilizing the same hash function used in step b) above, said sequences being of pluralities of possible numbers of delimited segments within said information items;

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f) comparing the hashes values evaluated in step e) above with
said hash values stored in step e) above.